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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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GRIFFITH D. NEAL

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07/09/2002

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EXAMINER

WAKS, JOSEPH

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 07/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/470,428

Applicant(s)

NEAL, GRIFFITH D.

Examiner

Joseph Waks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29, 32, 33, 37-44 and 46-49 is/are rejected.
- 7) ☒ Claim(s) 30, 31 and 34-36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 9, 2002 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-4, 6, 7, 10, 14-16, 20-27, 37-42, and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano (US 5,783,888)** in view of **Kuwert et al. (US 5,986,365)** and **Nakamura et al. (US 5,459,190)**.

Yamano discloses in Figure 5 a spindle motor having a rotating shaft 3, a hub 54 attached to the shaft and including a magnet 5b, a lower bearing 2a and an upper bearing 2b surrounding the shaft, a stator 6 comprising conductors 6a, and a monolithically formed body 57 substantially encapsulating the stator conductors wherein the thermoplastic material is molded to form the body configured to align the shaft, the hub and the bearings, a mounting features formed in the body (Re the apertures accommodating screws 1b) to mount the motor to a device powered by the motor, wherein the body surrounds the bearings, a core 6b, conductors 6a.

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However, **Yamano** does not disclose the hub including the permanent magnet and the molded material being injection molded.

Kuwert et al. disclose a spindle motor having a hub 3 including a permanent magnet 7 to drive a hard disc drive and a hub 3 comprising a disc support member (Re column 2, lines 25-30).

Nakamura et al. disclose an injection molded thermoplastic material 6 and having linear thermal expansion of $1.97 \times 10^{-5}/^{\circ}\text{C}$ or $1.09 \times 10^{-5} \text{ in/in } ^{\circ}\text{F}$ and thermal conductivity of 0.0040 to 0.0055 cal/s* $^{\circ}\text{C}$ or 1.67 watts/m $^{\circ}\text{K}$ (Re column 5, Table 1) and encapsulating stator conductors 10 for the purpose of protecting the motor from adverse working conditions such as mechanical stresses due to a pulsating torque and heat generated during motor operation (Re column 1, lines 21-30) while avoiding long curing time or deterioration of the insulating properties of the material caused by de-bonding resulted by vibration or thermal cycles the material is exposed during operation (Re column 1, lines 31-67 and column 2, lines 1-25)..

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor as taught by **Yamano** and to provide the hub including the permanent magnet as taught by **Kuwert et al.** For the purpose of driving a hard disc drive while simplifying the system controls and minimizing the size of the motor.

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the injection molded thermoplastic material as taught by **Nakamura et al.** For the purpose of protecting the motor from adverse working conditions such as mechanical stresses due to a pulsating torque and heat generated during motor operation while avoiding long curing time or deterioration of the

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insulating properties of the material caused by de-bonding resulted by vibration or thermal cycles the material is exposed during operation and to and dissipate the heat from the stator.

Re claim 29, the high speed operation is inherent to the motor structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor to meet the specific speed required for the memory drive application like at least 10,000 rpm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claim 42, the combined motor includes all elements essentially as claimed. However, it fails to disclose the thermoplastic material comprising polyphenyl sulfide.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor as taught by **Yamano** and to provide the thermoplastic material comprising polyphenyl sulfide for the purpose of providing electrically insulating material having good thermal conductivity, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Re claim 44, the recited limitation of the bearing being press fit to the body is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

4. **Claims 5, 8, 11-13, 17-19, 28, 32, and 46-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano (US 5,783,888)** in view of **Kuwert et al. (US 5,986,365)** and

Nakamura et al. (US 5,459,190) as applied to claim 1 above and further in view of **Shioya et al. (US 5,942,824)**.

The combined motor discloses all features essentially as claimed. However, it does not disclose the shaft being fixed relative to the body, and the second magnet encapsulated within the body and serving as an enhancement or a magnetic bearing magnet.

Shioya et al. disclose in Figure 7 a high speed spindle motor comprising a shaft 62 fixed relative to a monolithically formed body 126, 124 substantially encapsulating the stator and the insert 72, for the purpose of forming a hydrodynamic bearing structure and providing a back iron for a coreless stator structure, and a second, enhancement magnet 128 being a part of a magnetic bearing.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the shaft being fixed relative to the body as taught by **Shioya et al.** for the purpose of forming a hydrodynamic bearing structure and providing a back iron for a coreless stator structure. It would have been further obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the second magnet encapsulated within the body as taught by **Shioya et al.** For the purpose of enhancing the alignment of the rotor during operation and to provide a non-friction thrust bearing.

Re claim 33, the recited limitation of the body being machined is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Re claim 43, the recited limitation of the shaft being fixed to the body by molding with the stator in the thermoplastic body is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano (US 5,783,888)** in view of **Kuwert et al. (US 5,986,365)** and **Nakamura et al. (US 5,459,190)** as applied to claim 1 above and further in view of **Kurosawa et al. (US 6,043,583)**.

The combined spindle motor discloses all elements essentially as claimed. However, it fails to disclose the motor having the permanent magnet concentrically disposed around the stator.

Kurosawa et al. disclose in column 1, lines 10-35 that the structures of inner and outer rotors as commonly used in spindle motors serving disc drives

It would have been an obvious matter of design choice to design the combined motor and to provide the motor structure with an inner or outer rotor as taught by **Kurosawa et al.** for service as disc drive rotors for computer or since applicant has not disclosed that the inner or outer rotor structure solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with an inner, outer or an axial gap rotor stator configuration.

Allowable Subject Matter

6. **Claims 30, 31 and 34-36** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claims 30, 31, 34, and 35, the feature of the insert providing rigidity of the body or enhancing the heat transfer away from the bearing and the stator or enhancing dampening motor vibrations or audible noise, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Re claim 36, the feature of the insert substantially encapsulated in the body and positioned between the shaft and the bearing, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

7. **Claim 45** is allowed.

The feature of the insert substantially encapsulated in the body and positioned between the shaft and the bearing, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Response to Arguments

8. Applicant's arguments filed on May 9, 2002 have been fully considered but they are not persuasive.

Re IDS, the Us Patent Nos. 4,128,527; 5,241,229 and 5,694,208 were considered and are incorporated in the notice of reference cited (PTO-892).

Re claims 1-4, 6, 10, 21-23, 26, 29, 37 and 49, applicants' attention is directed to Figures 1, and 3-5 where Yamano shows the apertures in the monolithically formed body 7, 37, 47 or 57 to accommodate screws 1b for mounting the motor on the device it powers. Applicants' arguments with respect to injection molding is respectfully traversed by examiner since the argued distinct nature of the part resulted in this process is not supported by specification.

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Moreover, the injection molding of stator conductors and other parts of motor is well established in the art as clearly shown in paragraph 3 of this Office action.

9. Applicant's arguments with respect to claim 1-8, 11-23, 26-28, 30-35, 41, 43 and 44 have been considered but are moot in view of the new ground(s) of rejection.

Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Waks whose telephone number is (703) 308-1676. The examiner can normally be reached on Monday through Thursday 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

JOSEPH WAKS
PRIMARY PATENT EXAMINER
TC-2800



JW
July 3, 2002